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1. Your reference

RH/ALO/P/75586.GB/B 30JAN02 E692032-1 D02802
P01/7700 0.00-0202123.6

2. Patent application number
(The Patent Office will fill in this part)

0202123.6 30 JAN 2002

3. Full name, address and postcode of the or of each applicant *(underline all surnames)*

KNIGHT, Tony,
6 Astley Avenue,
Halesowen,
West Midlands,
B62 9TA.

Patents ADP number *(if you know it)*

8314809001

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

4. Title of the invention

Passenger check-in and monitoring system

5. Name of your agent *(if you have one)*

"Address for service" in the United Kingdom to which all correspondence should be sent *(including the postcode)*

Wilson Gunn Skerrett

Charles House,
148/9 Great Charles Street
Birmingham,
B3 3HT.

Patents ADP number *(if you know it)*

7710734001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and *(if you know it)* the or each application number

Country	Priority application number *(if you know it)*	Date of filing *(day / month / year)*

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing *(day / month / year)*

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? *(Answer 'Yes' if:*

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
c) any named applicant is a corporate body.
See note (d))

NO

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Continuation sheets of this form	
Description	09
Claim(s)	
Abstract	03 only (1)
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10. If you are also filing any of the following, state how many against each item.

Priority documents	
Translations of priority documents	
Statement of inventorship and right to grant of a patent *(Patents Form 7/77)*	
Request for preliminary examination and search *(Patents Form 9/77)*	
Request for substantive examination *(Patents Form 10/77)*	
Any other documents *(please specify)*	

11. I/We request the grant of a patent on the basis of this application.

Signature Wilson Gunn Skerrett Date 30/01/02

12. Name and daytime telephone number of person to contact in the United Kingdom

Richard Hill
0121 236 1038

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Notes

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PASSENGER CHECK-IN AND MONITORING SYSTEM

This invention relates to a passenger check-in and monitoring system for use at any location from which passengers can depart on their travels. It is thought that the invention will have particular application at Airports but it is not to be construed as being limited to this application.

Usually when travelling, a passenger will purchase a travel ticket prior to arrival at the departure location, for example an Airport, or alternatively may purchase a ticket from sales staff at the chosen departure location. In most circumstances, it is usual when the ticket is purchased, for the passenger details and travel details to be retained in a central database which is accessible by both the Airline with whom the passenger is travelling and the Airport authorities. The database is also accessible by both Airline sales staff and travel agents for booking purposes. Thus when a passenger enters an Airport to travel, a check-in process must be completed wherein the details held on the ticket, and the passengers identity, are checked against the details held in the database and, if they are correct and match, a boarding card is issued to the passenger to enable them to board the desired flight.

However, problems arise with such conventional check-in procedures insofar as the manual processing of check-in by Airport staff is time consuming and therefore it is not unusual for significant queues to form at check-in positions which has a deleterious effect on passengers.

A further problem which arises with conventional check-in systems is that, after having left the check-in position, it is not possible to know at any one time where each individual passenger is located. For effective security it can be advantageous to be able to monitor the whereabouts of passengers within the Airport buildings.

It is accordingly the object of the present invention to provide a passenger check-in and monitoring system in which the need for time consuming manual processing at check-in can be obviated or at least minimised. It is a further object of the present invention to provide a system in which the location of any one or more passengers within the Airport can be monitored at all times.

Thus and in accordance with the present invention there is provided a passenger check-in and monitoring system comprising a memory device containing travel and passenger information issued to a passenger when purchasing a travel ticket, a data storage device containing information relating to all available travel and passenger information and a plurality of transmitter devices operable to allow exchange of information between said memory device and data storage device.

With this arrangement it is possible to speed up check-in procedures and also increase security by allowing continuous monitoring of the location of passengers who have checked in.

The invention will be described further by way of example only and with reference to the accompanying drawings in which:

FIGURE 1 shows in diagrammatic form, one embodiment of a system in accordance with the present invention;

FIGURE 2 shows one example of the system of Figure 1 in use, in diagrammatic form; and

FIGURE 3 shows one example of how antennas can be position in a system of the kind of the present invention.

Referring now to Figure 1, there is shown one example of the system accordingly to the present invention.

The system includes a memory device 10 which is linked to a passenger travel ticket 11 and a data storage device 12 which contains all data relating to travel and passenger information.

The system also includes a plurality of antennas 13 to allow exchange of data between the data storage device 12 and the memory device 10.

The memory device 10 comprises an electronic tag, preferably a radio frequency tag, which may be provided as an integral part of the passenger travel ticket or may be formed as a separate part attached or linked thereto. Data is stored digitally in the tag and is interrogated by radio frequency signals from the antenna 13.

The data storage device 12 comprises a microprocessor based system or computer system upon which data relating to all available flights and details of passengers booked to travel on those flights is stored.

The antennas 13 comprise conventional radio frequency antennas and are designed to facilitate the transmission of data from the tag 10 to the data storage system 12 and vice versa. The antennas 13 are provided at specific locations around the Airport building in a manner which will be described hereinafter.

In use, as shown in Figure 1, a passenger 14 who wishes to purchase a ticket to, for example fly to a particular desired location will approach a member 16 of the Airline staff at the Airport or a travel agent in a travel agents premises. The person 16 from whom the passenger is buying the tickets will enter the flight details and data regarding the identity of the passenger into an input device 17 for example, in the form of a computer terminal. The computer terminal 17 is linked to the central data storage system 12 which contains all flight details and passenger details for all flights. Once the usual checks have taken place, the passenger 14 is issued with a ticket 11 which has integrally formed therein an electronic tag 10. The flight and passenger details are transmitted by the central data storage system 12 using the antenna 13 to the tag 10 on the ticket 11. The ticket 11 issued to the passenger 14 will, in these circumstances, hold information regarding the passenger's travel plans and also the passenger's identity. The information

is transmitted from the data storage device 12 via the antennas 13 to the tag 10 on the passenger ticket in digital form, preferably at radio frequencies.

Once the passenger has been issued with a ticket for his chosen flight, the passenger 14 will travel to the Airport and will enter into a check-in area 21 as shown in Figure 2. The passenger 14 may for example enter the check-in area using an entrance "A" and provided adjacent to the entrance are antennas 13 which read the data stored on the passenger ticket and pass this data, along with the fact that the passenger has passed through that area, to the central data storage 12. In practice, passengers 14 will only be able to move around the check-in area of the Airport in a predefined route in order to ensure that their movements can be tracked. Having passed through the entrance "A" into the check-in area 21 the passenger will take a seat in a check-in waiting area 22. Bearing in mind that information has been passed to the central data storage system 12 that the particular passenger 14 has entered the check-in area 21, this information can be relayed to check-in staff 23 to allow them to check-in passengers sequentially as they arrive or to prioritise passengers for check-in on any suitable basis. Thus, when it is a particular passengers turn to be checked in by the check-in staff 23, his details will appear on for example a screen display 24 provided in the seating area 22 which indicates that a particular check-in position 15 is available for checking in of that passenger. The passenger will follow route "B" shown in Figure 2 to the check-in terminal 23 and the passengers passage along this

route may be monitored by suitably placed antennas 13 (not shown) which transmit to the central data storage system 12 that the passenger 14 has passed through route "B" to the check-out desk. If it is desired to prioritise one passenger as regards other passengers who have passed into the seating area 22 of the check-in lounge 21, this can be done and the prioritisation can depend on the time the passengers entry into the check-in area as compared with the departure time of the passenger's flight. For example, the closer the time of departure to time of entry of the passengers, the higher the priority to process the passenger. Thus, for example, the check-in staff's check-in system 23 may form a virtual queue which allocates each passenger to a position in the queue based upon their priority.

Once the passenger 14 has passed to the check-in position, the passenger will be checked in accordance with normal Airport and Airline procedures and will then be issued with a boarding card which will also contain an electronic tag upon which flight and passenger information is stored.

Having checked in for the flight successfully, the passenger will then exit via route "C" to the departure and gate area and once again passes through antennas 13 which read the tag on the boarding card and update the central data storage 12 as to the fact that the passenger has passed from the check-in area into the departure lounge.

An advantage of the system as described above is that as the passenger and flight details on the ticket 11 are scanned and updated upon entry into the check-in area, upon passage from the check-in area to the check-in desk and from the check-in desk into the departure lounge, if a person who is not authorised to be in any particular area is detected in that area then appropriate action can be taken. As for example if a passenger either deliberately or inadvertently attempts to enter the check-in lounge 21 and pass to the departure lounge without checking in, this would be detected by the antennas 13 placed at route exit "C" which would detect the fact that the passenger has not been checked in at the checking desk since the update provided to the tag and check-in would not be present on that passenger's card. Furthermore, once a passenger has been checked in, the check-in system 23 will automatically update the central data storage 12 and this will automatically cause the next passenger listed in the virtual queue to be advised via the display 24 at the seating area 22 that a check-in desk is available for checking in.

Obviously, it will be appreciated that with the system as described above, a passenger's route through the check-in desk to the departure lounge can be monitored very easily and conveniently and furthermore the position of the passenger in the check-in area can be monitored precisely. However, there is the situation of when the passenger is not in the check-in area. This can be solved by linking to the central data system 12 a series of

strategically placed antennas 13 throughout the Airport building can monitor where any particular passenger is at any particular time. As shown in Figure 3, a series of antennas 13 can be mounted in any one area which can ensure that the entire area is monitored such that the position of a passenger can be identified precisely. In the examples shown in Figure 3, the antennas can be mounted in the ceiling and walls and doorways so as to ensure total coverage. If a passenger is detected in an area where he should not be, or no signal is detected from that ticket for a given time, this can cause a suitable security alarm to be generated which is passed to Airport security staff.

It will be appreciated that the system of the present invention offers significant advantages over existing check-in and security staff insofar as the check-in procedure can be considerably streamlined and semi-automated and security can be considerably improved by allowing constant real time monitoring of passenger movement.

It will of course be understood that the invention is not intended to restrict to details of the above embodiment described by way of example only.

Thus for example, the system of the invention can be modified to allow detection of a passenger entering the check-in area where no tag 10 is detected or the radio frequency signal from the antennas cannot reach the tag to interrogate the tag for example due to the signal being blocked by luggage or other structures. The modification may comprise an additional

optical or other suitable sensor at entrance "A" shown in Fig. 2. The optical sensor will detect the entry of a person into the check-in area and, if no tag is detected at the same time by the antenna, the central storage device 12 will detect the absence of a tag 10 and can alert security staff in any suitable manner.

Further, it is also possible to arrange for display on display 24 the identities of all passengers where tags have been detected by the antennas and passengers can be suitably instructed, upon entry into the check-in area, to check the display 24 to ascertain whether their tag 10 has been detected and, if not, to alert airport staff to the fact.

Still further, it is of course possible to attach similar tags 10 to luggage intended for the hold or hand baggage. The tag 10 can be incorporated within, or otherwise associated with or attached to conventional luggage labels applied to baggage or check-in. Luggage information can therefore also be stored in the central storage device 12 thereby allowing luggage also to be tracked or associated with a particular passenger. If the luggage and passenger are detected in different locations, or the passenger is not detected at all, security staff can be alerted.

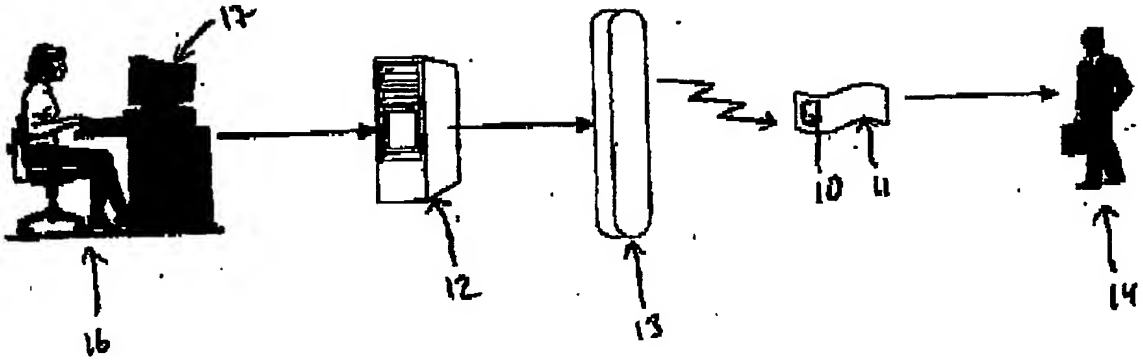
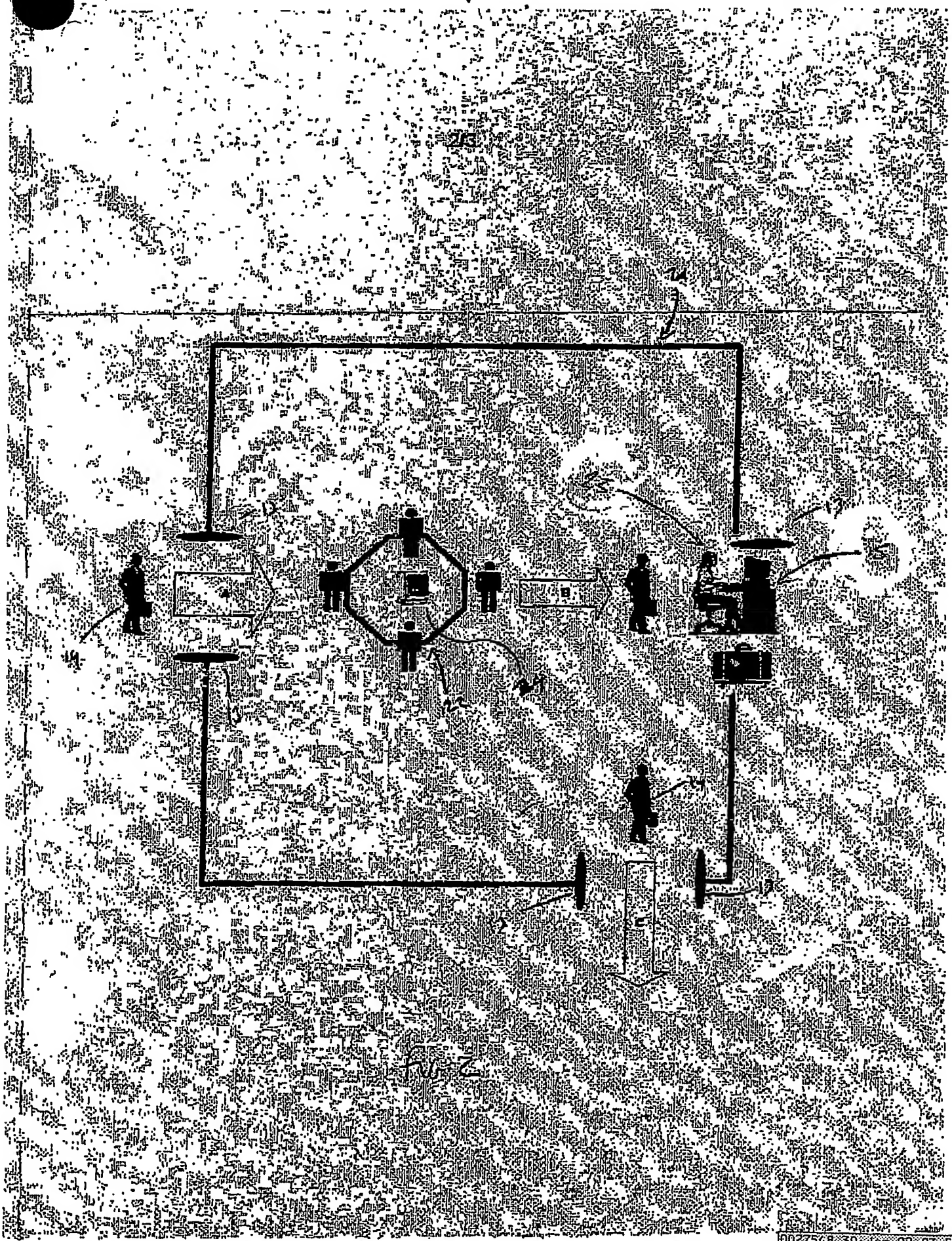


FIG-1.



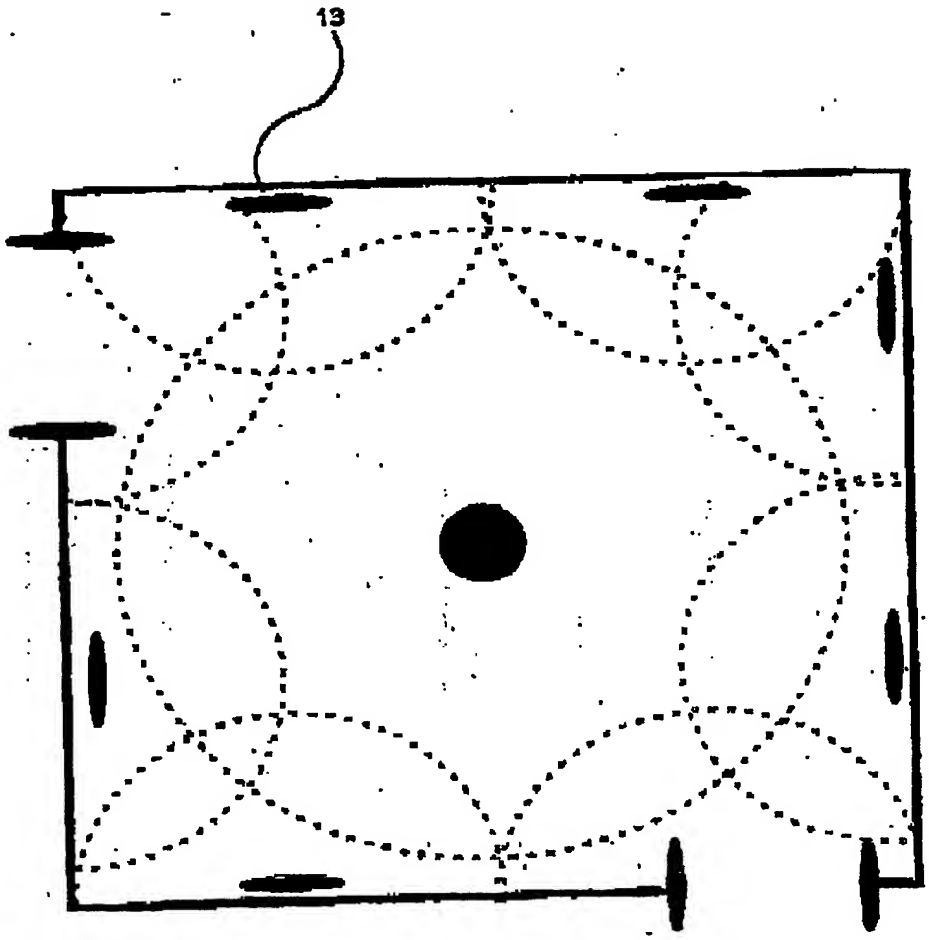


Fig 3.